WHAT IS CLAIMED IS:

1. A method of depositing a thin film on a substrate, the method comprising the steps of:

ablating a target with a laser beam creating a plume having charged species and neutral species;

introducing the plume into a confinement magnet for focusing the plume and reducing divergence thereof, the confinement magnet generating a first magnetic field substantially parallel to a plume ejection direction from the target; and

deflecting by a second magnetic field the charged species in the plume towards the substrate to deposit the charged species on the substrate, the second magnetic field being generated by a deflection magnet, the deflection magnet having a bend incorporated therein for deflecting the charged species away from the plume ejection direction and onto the substrate.

2. The method of claim 1, wherein the confinement magnet is a tubular magnetic member with an opening extending therethrough for receiving the plume.

3. The method of claim 1, wherein the deflection magnet is a tubular magnetic member with an opening extending therethrough for receiving the plume, the bend being formed at an end proximate to the substrate.

4. The method of claim 1, wherein the bend is a 45° bend.

5. The method of claim 1, further including:

electrostatically deflecting the charged species within the deflection magnet.

6. The method of claim 5, wherein electrostatically deflecting the charged species comprises:

disposing a first deflector plate along a first portion of the deflection magnet;

disposing a second deflector plate along a second portion of the deflection magnet;

positively charging the first deflector plate;

negatively charging the second deflector plate so that an electric field is generated in the deflection magnet in a direction from the first deflector plate toward the second deflector plate; and

repelling negatively charged species away from the first portion and towards the second portion so as to assist the charged species in being deflected onto the substrate.

7. The method of claim 6, wherein the negatively charged species are electrons.

8. The method of claim 6, wherein the first portion is an outer curvature section of the deflection magnet in direct line of sight with the target and the second portion is an inner curvature section of the deflection magnet away from the direct line of sight of the target.

9. The method of claim 1, further including the step of:

rotating one of the substrate and the target.

10. The method of claim 1, further including the step of:

altering the characteristics of an inner surface of the deflection magnet for removing select constituents of the plume as the plume is influenced by the second magnetic field.

11. The method of claim 10, wherein the step of altering the characteristics of the inner surface comprises the step of:

providing one or more baffle members along the inner surface.

12. The method of claim 10, wherein the step of altering the characteristics of the inner surface comprises the step of:

roughening the inner surface so to create a roughened, non-uniform inner surface.

13. The method of claim 6, further including the step of:

insulating the first and second deflector plates from a magnetic inner surface of the deflection magnet.

14. The method of claim 1, wherein the second magnetic field is substantially parallel to the plume ejection direction.

15. A magnetic field pulsed laser deposition (PLD) system for depositing a thin film on a substrate, the system comprising:

a member for holding a target;

a laser source producing a laser beam that is focused on the target to ablate the target and form a plume having charged species and neutral species;

a confinement magnetic device disposed proximate to the target such that the plume is influenced by a first magnetic field generated by the confinement magnetic device, the first magnetic field causing the plume to become more focused, thereby reducing the divergence thereof, the first magnetic field being substantially parallel to a plume ejection direction of the plume as it travels away from the target; and

a deflection magnetic device arranged relative to the confinement magnetic device so that the focused plume discharged from the confinement magnetic device is deflected by a second magnetic field generated by the deflection magnetic device, the second magnetic field causing the charged species in the plume to be deflected towards the substrate on which the charged species are deposited to form the thin film, the deflection magnetic device having a bend incorporated therein for deflecting the charged species away from an axis containing the plume ejection direction and onto the substrate.

16. The system of claim 15, wherein the target is selected from the group consisting of titanium, aluminum, aluminum nitride, titanium nitride, carbon, titanium carbide and a combination thereof.

17. The system of claim 15, wherein the laser beam is a pulsed laser beam.

18. The system of claim 15, wherein the confinement magnetic device is a magnet having a ring shape with each end being open and an opening extending through the magnet along a longitudinal axis thereof.

19. The system of claim 15, wherein the confinement magnetic device is formed of a first permanent magnet and a second permanent magnet, each of the first and second permanent magnets having a north (N) pole and a south (S) pole, the first and second permanent magnets being arranged so that the respective north poles oppose one another and the respective south poles oppose one another.

20. The system of claim 19, wherein the first and second permanent magnets are spaced apart, forming a gap therebetween, the plume being directed into and traveling within the gap from one end of the confinement magnetic device to the other end thereof.

21. The system of claim 15, wherein the deflection magnetic device is formed of a series of spaced magnetic coils, the bend causing the charged species to be deflected onto the substrate which is disposed away from a direct line of sight of the target.

22. The system of claim 21, wherein the deflection magnetic device is one of a unitary magnet having the series of magnetic coils incorporated therein and a series of separate magnetic coils that are spaced apart from one another.

23. The system of claim 15, wherein the deflection magnetic member is a tubular shaped magnet having an opening extending therethrough for receiving the plume, the bend being formed at an end proximate to the substrate.

24. The system of claim 15, wherein the bend is a 45° bend.

25. The system of claim 15, wherein the deflection magnetic device has one or more baffle members formed along an inner surface thereof for capturing at least one of large atomic clusters and particulates as the plume travels through the deflection magnetic device.

26. The system of claim 15, wherein the deflection magnetic device has a roughened inner surface for capturing at least one of large atomic clusters and particulates as the plume travels through the deflection magnetic device.

27. The system of claim 15, further including:

a positively charged first deflector plate disposed along a first portion of the deflection magnetic device; and

a negatively charged second deflector plate disposed along a second portion of the deflection magnetic device, wherein an electric field is generated in the deflection magnetic device in a direction from the first deflector plate toward the second deflector plate such that negatively charged species of the plume are repelled away from the first portion and toward the second portion so as to assist the charged species in being deflected onto the substrate.

28. The system of claim 27, wherein the negatively charged species comprises electrons.

29. The system of claim 27, wherein the first portion is an outer curvature section of the deflection magnetic device substantially in direct line of sight with the target and the second portion is an inner curvature section of the deflection magnetic device substantially away from the direct line of sight of the target.

30. The system of claim 27, wherein the first and second deflector plates are insulated from the deflection magnetic device by disposing a substrate between each of the first and second deflector plates and the substrate.

31. The system of claim 30, wherein a bias voltage is applied to the first and second deflector plates, the bias voltage being modulated in value over a period of time so as to effectively vary a thickness of the thin film over a select region of the substrate.

32. The system of claim 15, wherein the target is rotated to periodically expose a surface of the target to the laser beam to ablate ths surface of the target to create the plume.

33. A magnetic field pulsed laser deposition (PLD) system for depositing a thin film on a substrate, the system comprising:

a rotatable holder holding a target;

a deflection magnetic member having a longitudinal bore extending therethrough from a first end to an opposing second end, the bore being of sufficient dimensions to accommodate the platform and target therein, the deflection magnetic member having an access port formed through a side wall thereof and opening into the bore, the deflection magnetic member generating a magnetic field axially along a longitudinal length of the deflection magnetic member, wherein the substrate is disposed proximate to the second end of the deflection magnetic member such that the substrate is axially aligned with the longitudinal bore; and

a laser source producing a laser beam that is focused on the target through the access port to ablate the target and produce a plume having charged species and neutral species that are deposited onto the substrate to form the thin film.

34. The system of claim 33, wherein the magnetic field is parallel to an ejection direction representing a direction that the plume travels after being formed by ablation of the target.

35. A magnetic field pulsed laser deposition (PLD) system for depositing a thin film on a substrate, the system comprising:

a rotatable holder holding a target;

a deflection magnet having a longitudinal bore extending therethrough from a first end to an opposing second end, the bore being of sufficient dimensions to accommodate the platform and target therein, the deflection magnet having a first bend in a first direction along its longitudinal length and a second bend in a second direction along the longitudinal length, the first direction being opposite to the second direction, the deflection magnet having an access port formed through a side wall thereof and opening into the bore, the deflection magnet generating a magnetic field along its longitudinal length, wherein the substrate is disposed proximate to the second end of the

deflection magnet such that the substrate is axially aligned with the longitudinal bore;

a laser source producing a laser beam that is focused on the target through the access port to ablate the target and produce a plume having charged species and neutral species that travel through the longitudinal bore and are deposited onto the substrate to form the thin film; and

means for electrostatically deflecting the charged species within the longitudinal bore of the deflection magnet.

36. The system of claim 35, wherein the first bend is a 45° bend and the second bend is a 45° bend, thereby causing the deflection magnet to have an "S" shape.

37. The system of claim 35, wherein the means for electrostatically deflecting the charged species comprises first and second deflector plates disposed within the longitudinal bore at least along the first bend and third and fourth deflector plates disposed within the longitudinal bore at least along the second bend.

38. The system of claim 37, wherein the first and second deflector plates are disposed opposite one another with the first deflector plate being negatively charged relative to the second plate so as to generate an electric field

that repels negatively charged species away from the first deflector plate and assists them in traveling around the first bend, the third plate being negatively charged relative to the fourth plate so as to generate an electric field that repels negatively charged species away from the fourth deflector plate and assist them in traveling around the second bend.

39. The system of claim 36, wherein the plume initially travels in a first direction after it is formed and the deflected plume exits the deflector magnet in a second direction which is parallel to the first direction.

40. A magnetic field pulsed laser deposition (PLD) system for depositing a thin film on a substrate, the system comprising:

a rotatable holder holding a target;

a confinement magnet formed of a first permanent magnet and a second permanent magnet, each of the first and second permanent magnets having a north (N) pole and a south (S) pole, the first and second permanent magnets being arranged so that the respective north poles oppose one another and the respective south poles oppose one another, the holder and target being disposed proximate to a first end of the confinement magnet;

a deflection magnet having a longitudinal bore extending therethrough from a first end to an opposing second end, the bore being of sufficient dimensions to accommodate the platform and target therein, the

deflection magnet having a first bend in a first direction along its longitudinal length and a second bend in a second direction along the longitudinal length, the first direction being opposite to the second direction, the deflection magnet generating a first magnetic field along its longitudinal length, wherein a second end of the confinement magnet is disposed proximate to the first end of the deflection magnet and the substrate is disposed proximate to the second end of the deflection magnet such that the substrate is axially aligned with the longitudinal bore;

a laser source producing a laser beam that is focused on the target to ablate the target and produce a plume having charged species and neutral species, the plume being influenced by a second magnetic field generated by the confinement magnet, the second magnetic field causing the plume to become more focused, thereby reducing the divergence thereof before the focused plume enters the longitudinal bore of the deflection magnet where the first magnetic field causes the charged species in the plume to be deflected towards the substrate on which the charged species are deposited to form the thin film; and

means for electrostatically deflecting the charged species within the longitudinal bore of the deflection magnet.